

# CutPRO®'s industry tips on the right cut level

Whether it's gloves, shirts, jackets or trousers, we at CutPRO® are regularly tasked with explaining the meaning of such common labels as 'cut level 1' or 'cut level 5' on cut-resistant clothing - much of which is rated according to the parameters associated with protective glove testing.

Robert Kaiser - CEO  
**CutPRO®**

**A**s for any industry where safety is a priority, glass cutting warrants the application of several standards when determining which cut level is the right one for workwear.



## CUT RESISTANCE

In Europe we once had the EN 388:2003 standard, which resulted in anything between Cut Level 1 and Cut Level 5. That cut-test method, called the Coup test, used a constant weight on a rotating circular blade that was moved back and forth across a sample by the test machine. However, the test is no longer seen as 'ideal' when measuring the cut resistance of gloves, garments or fabrics made from high performance, cut resistant fabrics such as Cut-Tex® PRO. These were 'engineered' using a specific fibre composition (including glass fibres, stainless steel, or a mixture of technical fibres) that ultimately dulls the test blade - potentially leading to an incorrect and artificially high cut level.

Now the revised version can test those 'high performance, cut resistant fabrics' and products, making the EN 388:2016 today's mandatory performance standard in Europe. This uses the ISO 13997 test protocol as well as the TDM-100 cut test machine - resulting in performance levels that range from Cut Level A to Cut Level F. Indeed, Cut Level E and F are now widely seen as 'high cut resistance levels'.

## THE TOMODYNAMOMETER

Also designed to test high performance cut resistant fabrics or clothing, the TDM-100 cut test machine

(Tomodynamometer) delivers undisputable results. This test involves the interpretation of data obtained from applying and increasing the force/weight level of a strong rectangular test blade (which looks a little like an oversized razor blade) to cut through an object before recording the distance the blade will have travelled before ultimately cutting through it.

In America, the standard most commonly referred to is that of the ANSI/ISEA 105-2016, which is based upon values obtained from the ASTM F1790-05 method, which uses the very same TDM-100 cut test machine. Note here that the previous version, the ASTM F1790-04, was using the Coup test (as per EN 388 standard), albeit shifting its test apparatus to the TDM-100 cut test machine for precisely the same reason, i.e. to establish greater accuracy and a more reliable cut level.

In performance levels, the ANSI/ISEA 105-2016 standard -and test results- reaches from A1 to A9.

Of course, much more can be said about cut protection levels, tests and standards, though my own sense is that this can lead to further confusion rather than improved clarification.

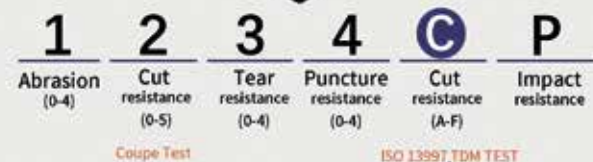
## THE RIGHT CUT LEVEL FOR CUT-RESISTANT WORKWEAR

So, what cut level do you need when, for example, considering cut resistant workwear in the flat glass or sheet

## EN 388: 2016

### CUT LEVELS EXPLAINED

#### EN388:2016



#### CUT LEVELS (A-F)

#### ISO 13997 TDM TEST

**A**

#### 2 - 5 NEWTONS

- General purpose
- Small parts assembly

**B**

#### 5 - 10 NEWTONS

- Packaging
- Warehousing & Logistics

**C**

#### 10 - 15 NEWTONS

- Light assembly
- Metal handling

**D**

#### 15 - 22 NEWTONS

- Automotive
- Construction

**E**

#### 22 - 30 NEWTONS


- Automotive
- Glass handling
- Metal stamping/handling

**F**

#### 30+ NEWTONS

- Metal stamping/handling
- Waste management
- Glass manufacturing/handling



		EN 388					
							
		2 X 4 X E P					
	EXAMPLE						
Abrasion (cycles)	LEVEL 2	←					
Cut (Coup Test)	NOT TESTED	←					
Tear (N)	LEVEL 4	←					
Puncture (N)	1 - 4	←					
Cut (TDM-100 Test)	LEVEL E	←					
Impact Protection	ACHIEVED	←					

metal industry? Most professionals will agree that ANSI 105-2016 Cut Level A5 and ISO 13997/EN388:2016 Cut Level E are both ideal for individuals who either encounter -or are required to manually handle- sharp blades or sheet metal, or who work in the flat glass or float glass production and processing industry. Such a cut level will offer outstanding and sufficient protection, whilst being both user-friendly and comfortable.

We at CutPRO® Cut Resistant Clothing hold firmly to the dictum: ‘the best is not good enough’, consistently underscoring our relentless desire to improve what we do. Our protective work-



	Low		Medium		High	
EN388:2003	1	2	3	4	5	
EN388:2016	A	B	C	D	E	F



wear offers 'benchmark' protection levels, also since we strongly believe it's always better to be on the safe side as long as protective garments remain lightweight, thin and breathable. Mind, though, that cut resistance tests and levels are just one element of what needs to be considered. Two additional protection levels merit investigation before any cut-resistant garment purchase - namely puncture resistance and tear resistance.

### PUNCTURE RESISTANCE

Punctures are often misreported as cuts. The risk here is that a sharp edge, a corner or any other such overhanging sharp hazard could penetrate a glove or garment, thus cutting into skin. With many gloves or garments made from some knitted fabric, and depending upon knit density, the gauge of the fabric (the measure of the number of knitting needles per inch) and thickness of the fibres, such protective garments/fabrics may leave 'tiny windows' (knitting loops) that can still allow some pointed

sharp object to cause a puncture or cut injury. Here the EN 388:2016 test standard results in level 1 to level 4 of puncture resistance.

### TEAR RESISTANCE

Subject to precise job responsibilities within any work environment, coupled with the usual 'wear and tear', every garment can ultimately develop tiny, often unnoticeable cuts. Indeed the time it takes for those tiny and unnoticeable cuts to turn into larger cuts and holes, thereby exposing the wearer to much greater risks of cut injuries and laceration, is primarily determined by the garment's tear resistance. Here a protective garment can offer anything between EN 388:2016 level 1 to level 4 of tear resistance.

CutPRO Cut  
Resistant Clothing

**CutPRO**  
Clothing

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